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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR NOVEMBER 1941

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REMEMBER PEARL HARBOR

ADMINISTRATION

Rohwer and Popham Receive New Assignments

On December 4, 1941, Sievert A. Rohwer was placed in charge of regulatory work, retaining his position as first assistant chief of the Bureau, and William Lee Popham was appointed an assistant chief in charge of control operations.

Mr. Rohwer was born in Telluride, Colo., on December 22, 1888. He was educated in Colorado and came to the Department in 1909 as a taxonomist. In 1923 he was placed in charge of the new Division of Insect Identification of the Bureau of Entomology, and in 1927 was assigned to general administrative duties. When Plant Quarantine and Control Administration was created in 1928 he was appointed assistant chief of that Bureau. In 1933 Mr. Rohwer was transferred to the Bureau of Entomology as assistant chief and continued as such when the Bureau of Entomology and Plant Quarantine was created in 1934.

Mr. Popham was born in Corvallis, Mont., on February 26, 1901. He received a B. S. degree in agriculture from Montana State College in 1923, and did 2 years' postgraduate work in botany and plant pathology at the same school. His first position was with the Montana State Horticultural Board, and he entered the Department of Agriculture's Bureau of Plant Industry in September 1924 as a State leader in black stem rust control. In 1928 he became regional leader for Montana and Wyoming and in 1930 a field supervisor for 13 North Central States. He came to Washington as assistant chief of the Division of Barberry

Eradication in 1931 and when this work was taken over by consolidation with the Bureau of Entomology and Plant Quarantine in 1934 he was placed in charge of barberry-eradication work.

Report by Bureau Eyewitness of Attack on Pearl Harbor

"On the morning of December 7, 1941, Jim Nichols and I had gone to Hickam Field for a routine inspection of planes due to arrive at 6 a. m., and also to cover ships due to arrive at Pearl Harbor, which is adjacent to Hickam Field, a little later. Since the planes had not arrived by 7:30 a. m., I told Jim that perhaps I should go over to Pearl Harbor and see if the ships had entered. On the way over to the Pearl Harbor Gate, I had a hunch that maybe it would be better if I 'phoned the Officer of the Day from the Gate, and, if the ships were not in, go back to Hickam Field to help him. I called the O. D. and he told me the first ship would dock in about 45 minutes, and asked me to come up and have coffee with him and the customs officers. At first I thought I might do so, especially since I had not had any that morning, but before I had much time to think, I had told him that I had to go back to Hickam to do some work. When I returned to Hickam Field, about 7:45, Nichols was walking around outside the operations building. I honked, and he came over and sat in the car with me. We had sat there talking perhaps 5 or 6 minutes when suddenly the quiet Sunday morning air was torn with the droning, whistling screech of planes in the direction of Pearl Harbor. Then we heard an explosion, then another, We immediately got out of the car, and saw dive bombers diving into Pearl Harbor in quick succession, each releasing his deadly explosives. We watched this, stunned, for perhaps 30 seconds, thinking at first--and hoping--that it was practice fire. Boiling, swirling clouds of black smoke told us, however, that this was not a practice session, but the real thing. Of a sudden there came roaring from high above on our right a dive bomber, nosing directly toward our location in Hickam Field. The bomb burst within perhaps a hundred yards of our car, sending giant streaks of bluish-brown soil high into the air. Up to this time, I had noticed no unusual activity on the field; the men standing around seemed stunned, as we were, at the show taking place before our eyes. Then I asked Jim if he didn't think we should try to get out of the reservation before activities or bomb holes blocked our way. I suppose he said 'yes,' because we were soon under way. Now the air was filled with planes--not only dive bombers but with bombers skimming just over the trees and over our heads as we drove along. Army men with pistols pulled them out and shot at the invaders. They replied with machine-gun fire. The bullets made puffs of dust along our way and zinged through the air as they ricocheted off the pavement and other objects. We could see the bombs under the low-flying planes as they flew into Pearl Harbor. In the excitement, it seemed that there were hundreds of the ships, all enemy, but perhaps there were not more than a hundred. Before we were more than a mile from Pearl Harbor, other clouds of smoke were billowing from the Naval Reservation, and the sky was flecked with puffs of antiaircraft shells. Back in Honolulu the streets were quiet and no one seemed to know of the attack. Our fellow workers on Sunday duty in the Post Office laughed at our story of an attack on the islands. Of all the birthdays I will ever celebrate, December 7 of 1941 will no doubt remain the most indelibly marked."

W. C. Goolsby

BUREAU EMPLOYEES CALLED TO THE COLORS OR TRANSFERRED TO SPECIAL NATIONAL DEFENSE ASSIGNMENTS

James, Edwin F., Under Biological Aide, Fruit Ins., inducted, Select. Serv., November 7, 1941.

FRUIT INSECT INVESTIGATIONS

Lead arsenate injures peach foliage in South.--This year weather conditions in the South were unusually favorable for injury to peach trees from the use of lead arsenate. According to Oliver I. Snapp, of the Fort Valley, Ga., laboratory, some precipitation was recorded on 19 days in June, 16 days in July, and 16 days in August. Injury from lead arsenate applied to Elberta peach trees according to the regular schedule increased until, by the end of peach harvest on July 21, it amounted to very heavy foliage injury, severe defoliation, and occasional fruit injury. The trees that had received the regular schedule of lead arsenate sprays during the season were from 90- to 95-percent defoliated when the final observations for foliage injury were made on September 12, 7 weeks after peach harvest, whereas the trees that received no lead arsenate during the season were in full foliage on that date. This injury caused many fruit buds to open in September, which will reduce the 1942 peach crop on these trees.

Partial protection of raisins from saw-toothed grain beetle.--Two experimental stacks of boxes of stored raisins, prepared by Charles K. Fisher, of the Fresno, Calif., laboratory, were sampled at intervals. One stack was protected by an oil-filled trough barrier at ground level and by a canvas cover, edged with a tanglefoot preparation, to prevent infestation by insects falling from the roof structure. The other stack was unprotected. Before the storage period began, the raisins were passed over a cleaner. The calculated infestation of *Oryzaephilus surinamensis* (L.) per ton in the protected and unprotected stacks is shown in the following table.

Date of sampling	O. surinamensis in—			
	Protected stack		Unprotected stack	
	Immature	Adults	Immature	Adults
	Number	Number	Number	Number
December 7, 1940[1]	1,099	2,777	457	2,511
Do.[2]	111	186	69	379
March 1, 1941	0	0	0	263
April 5, 1941	0	203	0	2,548
May 3, 1941	5,212	316	14,579	1,944
June 7, 1941	6,329	1,600	48,806	6,314
July 5, 1941	8,867	7,126	11,670	13,157
August 2, 1941	3,033	2,933	3,038	4,921
September 6, 1941	649	1,538	802	6,915
October 4, 1941	249	3,019	120	15,218
November 1, 1941	384	1,536	114	35,380

[1] Before cleaning.

[2] After cleaning.

MEXICAN FRUITFLY CONTROL

No larvae nor adults found in Texas.--Grove inspections were made in November in 2,256 citrus plantings in Texas without finding any larval infestations of the Mexican fruitfly. Approximately 9,000 traps were also operated throughout this period, but no adult Mexican fruitflies were taken. From these results it would appear that the annual fly movement northward from Mexico is no further advanced than normally, and may be somewhat later this season than usual. Fruit certified for shipment from the regulated area amounted to 4,496.1 equivalent carlots during the month of November. For the season, fruit shipments have reached 7,398 equivalent carlots. This is a slight decrease from the amount of fruit moved from the area for the corresponding period last season.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Coleoptera captured in Japanese beetle traps during 1941.—Philip Luginbill, Lafayette, Ind., reports that, for the fourth consecutive season, the May beetles captured in Japanese beetle traps operated at many of the field stations of this Bureau through the cooperation of Erle G. Brewer, in charge of Japanese beetle quarantine operations, were sent to the Lafayette laboratory for determination and study. With these Phyllophaga were many beetles of other genera, most of which were identified and included in a special report, which is on file in this Division. The collections during 1941 yielded 9,668 May beetles, representing 54 species and 3 varieties. These came from 64 locations in 22 States and, as in previous years, most of these were from the southern part of the

United States. These collections also provided new State records for 8 species, and 63 new county records for many other species.

Rice stinkbug as a pest of sorghum.—R. G. Dahms, Lawton, Okla., reports that sorghums at the United States Dry-land field station at Lawton were attacked by hordes of rice stinkbugs (Solubea pugnax Fab.) from August 7 to August 23, 1941. As there were many varieties and strains of sorghums growing at the station, an opportunity was afforded to study the effect of this insect on different varieties and on sorghums that matured at different dates. The varieties that were nearing maturity when the bugs invaded the field were injured less than were those in the early bloom stage. Plats of Sumac sorgo maturing on August 13, August 18, and September 5, yielded 49.6, 20.3, and 7.4 bushels per acre, respectively. One variety, White Darso, Ks. 33-378, was injured much less than were two other varieties of White Darso (Sharon X Darso Wdw. 48-12 and Dawn X Darso Wdw. 52-29), although all three varieties were "first headed" on the same day.

JAPANESE BEETLE CONTROL

Safety practices and Red Cross first-aid training.—To inexperienced men, scouting over rough terrain, climbing large trees, and topping and felling trees are dangerous occupations if definite safety practices are not observed. The use of poorly adapted W. P. A. personnel for such work has increased the need of safety training. Because the field crews are often away from roads and other help, first-aid training is important. Furthermore, the possession of good first-aid and snake-bite kits and a knowledge of first aid has often made it possible to help injured nonemployees. The foremanship training manual carried by each field crew contains a section on safety orders, regulations, and suggestions, and a section on first aid. The first-aid section is written to serve the type of injuries likely to occur and the conditions likely to be present at the accident site. Each crew or truck carries a 10-unit first-aid kit. The crews working at distances from their trucks carry pocket kits. Crews working in poisonous-snake areas carry snake-bite kits. Antivenom for the use of our men is kept at conveniently located hospitals, police stations, and physicians' offices. Red Cross first-aid training has been used extensively during the last 3 years to supplement our safety and first-aid training. Not only are all supervisors urged to take advantage of any Red Cross first-aid courses but security-wage workers are encouraged to join classes, often conducted by our supervisors. Of a total personnel of 2,200 over 350 have taken Red Cross first-aid work. In addition to these 350 men now employed, it is estimated that 1,000 former W. P. A. workers took first-aid courses when working on Dutch elm disease. Ten regular employees have instructor's certificates, 13 others have had advanced courses, and 45 have standard certificates, whereas only 8 have not taken advantage of first-aid courses. Among the field security-wage workers, there are 3 instructors, and 8 advanced and 262 standard certificates. Among the regular and W. P. A. employees at the Division headquarters there are 4 with standard training and 14 who expect to enroll in courses this season. Those now conducting standard and advanced courses are O. N. Liming, J. F. Wootten, D. H. Slayback, R. E. McCarthy, H. L. Cramer, S. L. Stonebraker, F. Theall, A. E. Peters, V. S. Manifold, and D. Buxton.

Connecticut sanitation crews aid in extinguishing fires.--A sanitation crew arrived at a property in Clinton to haul away a Graphium tree. They found painters had been burning paint off an unoccupied house. Blow torches had set fire to the walls and the fire had already reached the roof. The foreman immediately put into use his fire pump and at the same time sent a driver to the nearest telephone to notify the fire department. By the time the fire equipment arrived the blaze was pretty well under control. On another occasion a crew foreman, scouting ahead of his crew tagging trees to be removed, smelled smoke. He knew that he had no fires going in the vicinity and that there were no occupied residences nearby. He finally located a grass fire, which was spreading rapidly toward the barn in an unoccupied farmyard. With the help of one of his crew members, he beat out the flames and by the time help arrived had the fire under control.

Many confirmations obtained by sampling elms removed within 25-foot radius of confirmed trees.--Results obtained in Pennsylvania from removal of elms within 25 feet of original Dutch elm disease cases offer additional corroboration of the benefits of this practice. Some 20 confirmations have been obtained in the Allentown work area in this manner. In most cases the original suspect was removed as beetle material, and the removal of the 25-foot-radius elms could not be considered at that time. After a confirmation was received, permission was obtained for the cutting of nearby elms and several other diseased trees were found. In many instances the trees involved displayed no outward symptoms and very little streakage was present. In some places confirmations were obtained beyond the 25-foot radius by sampling all elms in the immediate vicinity of the original D. E. D. In the Easton district, 6 elms that were within the 25-foot radius have so far been confirmed. All were tagged by sanitation workers while carrying out assignments to remove these trees as elms near D. E. D. Four of the 6 so removed showed extremely few dying tips, while 2 showed none, and it is doubtful whether any apparent symptomatic wilt was present when the scouts first inspected them.

Beetle material left after lumbering in Berkshire County, Mass.--Beetle-material scouts in Massachusetts located an area of about 50 acres which had been cut over in connection with lumbering operations. Approximately 100 elms have been cut for lumber or damaged in the process. The elms cut are sawed into 2-inch by 6-inch timbers which, it is reported, are to be used for the crating and shipping of defense machinery built by a manufacturer in Pittsfield. The operation was started early in the fall and is still going on. The material first cut is heavily infested with Scolytus, and that cut at a later date is still potential beetle material. The beetle material in this area is almost as great as the total amount tagged in other parts of the area to date. It is believed that the Scolytus found in this area are the first to be found in Lenox Township. This discovery is not surprising as Scolytus has been found in nearly all of the adjoining townships. The county of Berkshire has large stands of white pine, and defense needs have increased the cutting of large amounts of this timber. In nearly every instance some elm is cut or damaged in the process. Seven of these areas have been found to date and they are an important source of beetle material.

Cooperation of property owners in Connecticut.--Through contact with the Connecticut Experiment Station, R. J. Benham, of Washington, Conn., learned that this project would remove and burn beetle-infested elm material, so he wrote the district supervisor asking that he inspect a tree on the Congregational Church property in Washington. The Experiment Station had notified him that it was beetle-infested and should be removed. It was a large and difficult topping job, and with the present scarcity of capable toppers in the district, it would have been an extremely difficult undertaking. Mr. Benham agreed to have the tree topped by a commercial tree company, and also made all arrangements necessary for acquiring a burning location from a local selectman. Permission was also obtained for the removal of freshly cut elm wood nearby. It is believed that Mr. Benham's active participation in the problem gave him a greater interest in the Dutch elm disease eradication project than if this project had taken over the entire job.

Opening of hunting season necessitates care in placing men.--With the opening of the small-game season in Pennsylvania on November 1, a large number of gunners were afield. Although some of the crews were scouting in areas well stocked with various kinds of small game, the shooting caused the men no inconvenience and there was no reason for removing the crews from these areas; however, when the bear and deer season opened the latter part of the month, crews were removed to safer areas. The possibility of being mistaken for a deer or bear is too great; then, there is always the chance of being struck by a stray high-powered-rifle bullet. A crew assigned to scout for beetle material in a large special problem swamp in the East Stroudsburg district of Pennsylvania ran into a bear and they all made for trees. One or two men who could not climb in training were able to make the grade under these circumstances.

Nursery cooperates by advising location of slash.--One of the local nurseries is wholeheartedly cooperating in the attempt to free the Wilkes-Barre, Pa., district of elm slash, which in the past has been found in large quantities and which in many cases has attracted large numbers of beetles. The nursery is engaged in clearing electric light and telephone wires in the city of Wilkes-Barre, the city of Nanticoke, and in the borough of Plymouth. During the course of this work they naturally cut considerable elm slash large enough to harbor beetle infestation. They keep the district office informed as to where the brush and limbs are taken, affording the opportunity of seeing that it is completely burned by the dump attendants or by our own crews.

Heavy beetle infestation in beaver swamp.--A large crew has been engaged in removing infested trees from a beaver-flooded swamp in the town of Washington, Dutchess County, N. Y. This work progressed rather slowly because of the deep water which covers most of the area. Beetles are extremely abundant in the trees being removed, Scolytus galleries predominating. Adults of Hylurgopinus were observed hibernating in the outer bark of some of the trees. A quantity of this material was collected for use of the Morristown forest-insect laboratory. As an indication of the density of the beetle population in this swamp, it was observed that the woodpeckers waddle rather than fly from tree to tree.

Ohio forest ranger approves burning methods.--The ranger of the State Forest at Zaleski, Ohio, made an inspection tour of the burning operations within forest lands in the Athens, Ohio, Dutch elm disease work area. He expressed his complete satisfaction with the methods of burning used on the project, especially the precautions exercised in presuppression work before fires are set. He was in full accord with the manner in which fires were safeguarded for the night, which consists of covering over the burning piles or ashes with a thick layer of earth.

Trees have place in war spheres.--The following news item appeared in the Stamford, Conn., Advocate of November 4: "The slogan, 'Doughboy, spare that tree!' may gain currency in the army if the advice of a Stamford tree expert is followed. In a letter to Secretary of War Stimson, F. A. Bartlett urged better protection of trees around army camps and airports for camouflage purposes. Reports from the European battle fronts, he said, indicate that high-speed cameras have exposed camouflage with fake trees and paint."

Interesting removal in Pennsylvania.--An interesting D. E. D. tree was removed in the Philadelphia district of Pennsylvania the first week of the month. It was a blown-over tree and color was found where the beetles had attacked it. This proved to be Ceratostomella ulmi, and when the tree was cut it was found that the color had penetrated to the stump. The tree stood on the bank of a wet-weather stream. When the top was removed, the trunk and stump assumed an upright position and the trunk section had to be felled in the regular way.

Tree-surgery company cooperates.--Mr. Sandt, a representative of a tree-surgery company, visited the East Stroudsburg district office of Pennsylvania and advised that he had a crew on line-clearance work for a power and light company and was conducting operations along the Delaware River and west to Log Taverns Ponds. He agreed to notify the district office of any elm material left over 3 inches in diameter.

Scolytus found entering green wood.--Recent observations in the southern part of Delaware County, Pa., indicate that Scolytus multistriatus Marsh. has again been attempting to enter green elm wood.

Property owner hires crew.--Three men in Columbia County, N. Y., did such a good job of removing a tree on a property that the owner hired them to take down another tree on one of their days off duty.

Speedy Bureau action authorizes reshipment of out-of-area elms.--Information was received on November 5 from a nursery located in the New Jersey Dutch elm disease regulated area, to the effect that they had an order for some elm trees to be delivered to a number of defense-housing projects in adjoining States outside the infected zone. They wished to purchase these trees in nonquarantined sections, bring them to their nursery, and ship them to the destination points along with items other than elms. Under proper safeguards there would be no hazard involved in handling elms from noninfected points when they are both received and reshipped during the dormant season of the insects that spread the disease. Observations of the Division of Forest Insect Investigations at the Morristown, N. J., laboratory show that the insect vectors of the disease fungus may come to nursery trees to feed and to hibernate any time between April 15 and October 15. Accordingly, such receipt and reshipment might be permitted with safety between November 1 and March 31. Recommendations for the issuance of administrative instructions to authorize reshipments of this nature were forwarded to Dr. Annand on November 5, and he issued the administrative instructions as B. E. P. Q. 517 on November 8, effective November 10. A form of identifying tag to cover these reshipments was devised and the nursery made their first reshipment under this authorization on November 24. There is a Japanese beetle inspector on full-time assignment at this nursery, so that the matter of receipt and segregation of the trees was under constant observation. This inspector also issued the tags at the times of reshipment. The reshipped trees had been received from a firm in Iowa.

Difficulty in obtaining temporary inspectors.--Competent, temporary inspectors, such as are usually available in the New England States during the Christmas-tree- and greenery-cutting season, have been almost unobtainable this year, owing to the draft and the demands for defense workers. The same difficulty was experienced in obtaining men for the seasonal nursery- and greenhouse-inspection work in the large Connecticut nurseries. In both instances it was necessary to employ some inspectors with little or no previous gypsy moth experience after a short period of schooling. Men who returned to the Bloomfield, N. J., headquarters from Japanese beetle soil-treating work in North Carolina and Ohio were immediately reassigned to the Christmas-inspection activities. Ordinarily these men would have been loaned to the Division of Domestic Quarantines for transit-inspection work during the heavy movement of Christmas ornamentals. Because of the threat of a railroad strike in November, cutters intensified their efforts to get their shipments off early. In a few instances it was necessary to employ some men in New Jersey and send them to New England on a temporary assignment. Nurseries and greenhouses are experiencing the same problem in obtaining help. Some of the establishments in the Philadelphia area were reported as unable to fill their orders for this reason. In New Jersey a number of nurserymen have offered to employ their help during the winter months, if they agree to stay until the end of May. In some instances wages have increased as much as $1 a day.

Heavily infested soil intercepted.--Among the interceptions at the Japanese beetle highway inspection station on U. S. Route 211 at Sperryville, Va., was a truck containing about ½ yard of soil, en route from Arlington, Va., to Roanoke, Va., the latter a point some 130 miles outside the main regulated area. The nurseryman had been doing some landscaping at Arlington and had loaded on his truck the surplus dirt remaining on the ground after his plantings had been completed. When informed of the quarantine, he immediately unloaded the soil and left it at the inspection station. Seventy Popillia japonica larvae were removed from the soil by screening prior to the usual fumigation of confiscated soil.

Baltimore office moved to Pikesville.--The district Japanese beetle quarantine office previously located in room 306, Post Office Building, Baltimore, Md., was moved late in November to 2 Sherwood Avenue, Pikesville, Md. The new quarters are in a one-story, concrete-block building. They are particularly satisfactory from the standpoint of light, office, garage, and parking space. The location is more centrally situated for activities in this area. The new office is a short distance south of Route 140.

FOREST INSECT INVESTIGATIONS

Pine reproduction weevil found on Sierra National Forest.--C. B. Eaton, of the forest-insect laboratory at Berkeley, Calif., reports the discovery early in November of an outbreak of Cylindrocopturus eatoni Buch. on the Harris Ranch burn, Miami ranger district, Sierra National Forest. The outbreak is in a stand of reproduction growing on the fertile slopes of a ridge southwest of Signal Peak Lookout. The infestation extends over an area of approximately 4,000 acres, which was naturally restocked with ponderosa pine seedlings following the fire that burned off the original stand of timber in 1934. It is estimated that between 25 and 40 percent of the pine on the burn has been killed. The appearance of the weevil-infested reproduction resembles the damage light ground fires sometimes cause to similar stands. Many trees are dead, having brown needles, while others are sickly and yellow. The mortality is not confined to individual trees scattered throughout the dense brush (Ceanothus spp.), which forms a major part of the cover, but it occurs in the patches of pure-pine reproduction spotted over the area, and in the scattered pine seedlings growing in the open over bear clover. By far the greater part of the damage has occurred within the last 2 years; however, there are remnants of trees infested earlier, and probably there has been an endemic infestation for some time. The insect is now in the larval stage, and a large potential population of weevils is present. This is the first occasion in which the pine reproduction weevil has been found to be causing economic damage in naturally established stands. Hitherto, it has only been known to be injurious to planted stock in the brush fields of northeastern California.

Infestation of Cacoecia conflictana in northern New Mexico.--An aspen leaf roller, which has caused severe defoliation of aspen on the Rio Pueblo drainage southeast of the Angostura Camp Ground, on the Carson National Forest in northern New Mexico, has been determined by J. F. G. Clarke as *Cacoecia conflictana* (Walk.). According to observations made by N. D. Wygant, Berkeley, from August 25 to 29, the infestation occurs at elevations of about 10,000 feet, and 2,000 acres or more have been heavily defoliated. Light damage to aspen was also observed in other areas on the Carson and Santa Fe National Forests in northern New Mexico. Previous records indicate that this insect is widely distributed from Maine to Utah and northward to Labrador and Alaska. At the time of the examination the insect was in the egg and newly hatched larval stages. The eggs are laid in flat masses, leaf-green in color, on the leaves and trunks of aspen. The larvae apparently feed on the leaves for a short time and then go to the ground for hibernation. The heavy defoliation occurs in the spring, when the larvae curl the leaves into trumpet-shaped rolls. When the insect was first observed by David O. Scott, district ranger on the Carson National Forest, on July 7, it was in the last-instar and pupal stages. Mr. Scott observed that the general emergence of the moths in the field was from about July 20 to about August 10. An ichneumonid parasite, *Herpestonus hariolus* (Cress.), was reared by him from both *C. conflictana* on aspen and *C. fumiferana* (Clem.) on white fir.

Tent caterpillar defoliates aspen in northern New Mexico.--The tent caterpillar *Malacosoma*, probably *fragilis* Stretch, defoliated about 4,000 acres of aspen in the Big Tesuque Creek Basin northeast of Santa Fe on the Santa Fe National Forest and about 25,000 acres northwest of Taos on the Carson National Forest in New Mexico during June and July, according to Mr. Wygant, who examined the area in the latter part of August. The infestation on the Big Tesuque Creek Basin received considerable attention by the press in New Mexico, leading people to believe that much of the aspen would be killed unless control is brought about. The aspen, much of which is 3 to 6 inches d. b. h. and 20 to 40 feet high, has little commercial value, but is highly prized by the natives for its scenic, recreational, and watershed-protection values. According to the Forest Service personnel, the insect has been widespread in the aspen in New Mexico and Arizona for years, with the worst epidemic years probably 1933-35. The heavy epidemic centers seem to shift from year to year, indicating that its natural control factors build up locally and bring about its control. Several consecutive years of defoliation are necessary to kill the trees on the usual sites, therefore little mortality of the trees has resulted. On the poorer sites the trees succumb to the effects of defoliation more quickly and mortality has been considerable in such small local spots.

Heavy infestation of Jeffrey pine cone moth in northeastern California.--Heavy damage to the 1940-41 Jeffrey pine cone crop was reported to P. C. Johnson by officials of the Modoc National Forest, during the annual forest-insect survey of this area early in October. An examination of Jeffrey pine stands in the Big Valley ranger district revealed a widely distributed infestation of cone moths, subsequently determined as Laspeyresia toreuta Grote. Preliminary field counts of cones showed a heavy incidence of attack and several sacks were collected from trees and shipped to the Berkeley laboratory. An examination of this material by J. E. Patterson on October 28, showed full-grown caterpillars and pupae in the axial region of the cone. Out of a total of 15,222 seeds, 35.8 percent had been destroyed by the young caterpillars; however, 90 percent of the cones were infested. This checked to some extent with records of the Durbin Nursery at Susanville, Calif., where 200 sacks of seed from this same area yielded slightly less than 50 percent of the expected normal amount. The examination at Berkeley further disclosed the presence of the following parasites and predators: A chalcid (8.0%), an ichneumonid (1.5%), a small maggot (2.4%), and an enoclerid (0.5%). Efforts of the Modoc National Forest to fully utilize the current Jeffrey pine cone crop, one of the heaviest in recent years, ended in disappointment and the abandonment of cone-collecting activities following the discovery of the infestation. Examinations of Jeffrey pine stands in the Lassen National Forest also showed a widely scattered but lighter infestation of cone moths. The current infestation in these two areas is of economic importance, owing to the infrequency of good seed years and the increasing demand of seed for reforestation.

Defense program accelerates salvage from Tillamook burn.--Early in November, while making an examination to determine the extent of insect-caused deterioration of fire-killed Douglas fir trees in the 8-year-old Tillamook burn, R. L. Furniss, of the Portland, Oreg., laboratory, found that the output of salvage operations has been greatly increased in response to the recent demand for low-grade lumber. Logs that only a short time ago would have been culled because of excessive borer holes are now being marketed at a profit. It is expected that the increased use of lumber cut from borer-infested logs will swell the already numerous reports of borers emerging from various parts of new homes. Cerambycids of the genera Criocephalus and Asemum are the principal insects responsible for these reports. Although the holes they cause are of considerable concern to property owners, the actual structural damage is slight. Apparently there is no danger of reinfestation.

Low winter temperature study continues.--Temperatures lethal to overwintering broods of the western pine beetle have not occurred in the pine forests of eastern Oregon and Washington during the last 4 winters. Nevertheless, according to J. M. Whiteside, of the Portland laboratory, a study designed to obtain data on low winter temperatures within the forest proper has again been set up this winter. Six natural divisions of the pine region of eastern Oregon and three life zones, corresponding to high, mid, and low elevations, within each division were selected for sampling. Thirty-six duplicate stations were located on the western pine beetle survey check plots within each zone. All we need now is some 20°- or 30°-below-zero weather to complete an analysis of variance.

Sanitation-salvage integrated with other marking practices.--Marking ponderosa pine timber on a sanitation-salvage basis, to remove from the stand trees highly susceptible to attack by the western pine beetle, is now being studied by the Forest Service and private operators as a desirable feature to combine with other marking practices, according to W. D. Bedard, Portland. Two 40-acre sample plots on the Deschutes National Forest have been marked in three differen ways, including sanitation-salvage in combination with a system of value selection. The Forest Service and lumber operators will study the results of the various systems for effect on the stand, value, and grade recovery, in the hope of evolving a revised marking rule which will be satisfactory to both Federal and private interests for use on Forest Service timber sales.

Elm bark beetle trapping experiment.--R. R. Whitten, of the Morristown, N. J., laboratory, has compiled data covering 4 consecutive years during which elm bark beetles have been trapped in a small woodland plot located at Whitehouse, N. J. The object of this experiment was to determine whether traps were effective in reducing the elm bark-beetle populations in small woodland areas. The traps used in this experiment were elm trees killed by the internal application of a water solution of sodium chlorate. Approximately 4 percent of the trees standing in this plot were used for each series of traps. This plot has an area of 3-2/3 acres and is surrounded by open farm lands, with occasional scattered elm trees. Through the cooperation of the Federal Dutch elm disease eradication unit, for the last 3 years all the elms within 2 miles of the plot area have been carefully examined and pruned of all parts infested or likely to be infested. This year, in addition to trapping beetles in this area, samples of the beetles were collected in individual, sterile, gelatin capsules and submitted to P. V. Mook, of the Bureau of Plant Industry, to be cultured for the presence of the Dutch elm disease fungus (Ceratostomella ulmi). The trapping results for 1938, 1939, 1940, and 1941, and the culture results for 1941, are presented in the following table:

Year	Total trap trees	Total sections	Scolytus multistriatus		Hylurgopinus rufipes		Beetles contaminated with C. ulmi
			Total galleries	Average galleries per section	Total galleries	Average galleries per section	
	Number	Number	Number	Number	Number	Number	Percent
May to July Traps:							
1938-----	22	95	5,667	59,65	2,850	30.000	—
1939-----	20	113	3,990	35.31	5,141	45.500	—
1940-----	18	120	2,298	19.15	4,849	40.410	—
1941-----	18	88	733	8.33	2,925	33.240	[1] 23.4
July to October Traps:							
1938-----	21	106	10,314	97.30	1	.009	--
1939-----	[2] 8	44	979	22.25	1	.023	—
1940-----	18	112	4,612	41.18	26	.232	—

[1] Beetles trapped 3 miles from Whitehouse plot were 14.5-percent contaminated.

[2] Beetles in over 50 percent of the traps treated did not die and so have not been included in the data.

Caged elm trees infected with Dutch elm disease fungus through S. multistriatus.--W. D. Buchanan, of the Morristown, N. J., laboratory, reports that 5 of 80 well-established trees growing in a large cage developed foliar symptoms of the Dutch elm disease. The trees were attacked by approximately 4,000 *S. multistriatus* that emerged from field-infested and infected logs in 1941. About 7.7 percent of the beetles were found to be contaminated with the Dutch elm disease fungus. Discoloration caused by the organism was found in the 1941 vessels of 8 of the 80 trees, but foliar symptoms developed in only 5 of them. The culture results indicate that most of the beetles had a very light load of *C. ulmi*, which probably explains why the Dutch elm disease did not develop in more of the trees.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Gypsy moth inspection work and Christmas trees.--The volume of evergreen boughs and Christmas trees cut in western Massachusetts and the southern half of Vermont appears somewhat smaller than usual, because of scarcity of skilled choppers. The operators have had to rely largely on the purchase of small lots of trees cut by farmers who have been attracted by the high prices. While little difficulty has been encountered in examining woodland areas for the gypsy moth well in advance of the regular cutting crews, the field supervisors have had to remain constantly on the alert to inspect the smaller scattered locations where the trees were being cut by the farmers. The operators are not permitted to cut boughs or trees in the immediate vicinity of an infested area.

Brush-disposal machines transferred to new locations.--The brush-disposal machine which was operated for several weeks in townships along the western border of Berkshire County, Mass., was recently transferred to Charlemont, in the eastern section of the county. Arrangements were also made to transfer the other machine from Connecticut to Massachusetts. The latter machine has completed the disposal of approximately 1,200 piles, or about 600 cords, of brush accumulated in some 35 acres of woodland found to be infested by the gypsy moth during the past year.

W. P. A. gypsy moth work in Vermont.--Six crews of scouts and one crew of laborers performed gypsy moth work in Vermont during November. Two of these crews continued scouting work in Lowell Township, Orleans County, where the prospect of completing the work in the most inaccessible areas before the advent of severe winter conditions had appeared to be good. However, the resignation of several W. P. A. employees reduced these crews to such an extent that it is now very doubtful whether the scouting work in Lowell can be finished before the minor roads are blocked by snow. Another crew has found no evidence of the gypsy moth while scouting in Swanton Township, Franklin County, where woodland areas are relatively small and scattered. Three single-egg-cluster infestations were found and creosoted by two crews which have already finished scouting a large portion of Middletown Springs Township, in Rutland County. No indication of gypsy moth infestation has been discovered by a crew scouting in Sudbury, Rutland County. The crew of laborers was engaged in chopping dead and worthless trees and creosoting egg clusters at a woodland infestation in Woodford, Bennington County. Scouting conditions were generally good during November, although some time was lost because of stormy weather during the first part of the month. A 7-inch snowfall in Lowell Township caused no serious interruption in gypsy moth work. Unseasonably warm temperatures and drying winds caused the forest litter to dry rapidly and again produced dangerous fire conditions during the latter part of November. The gypsy moth crews were detailed to work in open country in the vicinity of settlements, and in other localities not likely to be frequented by hunters during the deer-hunting season, which comprised the last week in November.

W. P. A. gypsy moth work in Massachusetts.--At the beginning of November 9 W. P. A. crews were engaged in scouting for the gypsy moth in the townships of Hinsdale, Mount Washington, Richmond, Savoy, Washington, West Stockbridge, and Windsor, in Berkshire County, and in Blandford Township, Hampden County. Numerous small scattered infestations were discovered in each of these towns. In addition to the scouting, considerable treatment work at infested locations was performed by 10 crews of laborers in the townships of Alford, Lanesboro, North Adams, Peru, Richmond, and West Stockbridge, all in Berkshire County. The work of the laborers consists chiefly of rough creosoting of egg clusters;cutting dead, defective, and otherwise worthless trees; and piling the resultant brush and limb wood for disposal by burning or by means of the brush-disposal machines. The crews engaged in thinning and ground work at a gypsy moth infestation in Richmond Township have already accomplished much treatment work, including the creosoting of large numbers of egg clusters in the most heavily infested spots scattered through the woodland area. As usual, these spots of heavy infestation are found in areas where the tree growth is composed of species most favored as food by the gypsy moth. So far as possible the favored species, such as poplar, gray birch, and oak, are being removed.

W. P. A. gypsy moth work in Connecticut.--Of the 4 W. P. A. gypsy moth scouting crews working in Connecticut at the beginning of November, three were scouting in Litchfield and Salisbury Townships, in Litchfield County, and the other was working in Southbury Township, New Haven County. All scouting work planned for Litchfield Township was completed by the middle of November, and the crew was assigned to scout in the vicinity of infestations located during the last fiscal year in the neighboring town of Cornwall. A few scattered infestations were found in each of these towns. A crew of laborers was detailed to treatment work at a gypsy moth infestation in Litchfield Township during the month. As a result of a cooperative arrangement with the State of Connecticut, one State crew was assigned to scouting work in Kent Township, Litchfield County. Considerable difficulty has developed in connection with the transportation of W. P. A. workers, particularly in Connecticut and Massachusetts, because age or physical infirmity renders many of the men assigned to gypsy moth work unfit to operate Government-owned vehicles. In some sections it has been necessary to assign regular employees to the task of transporting W. P. A. crews to and from work daily.

W. P. A. gypsy moth work in Pennsylvania.--The number of W. P. A. employees engaged in gypsy moth work in Pennsylvania remained fairly stable during November, ranging from a high of 630 to slightly less than 600. This force was divided into 32 crews of scouts and 12 crews of laborers. Fourteen of these scouting crews and 4 crews of laborers were assigned to work in Luzerne County, 8 scouting crews and 5 crews of laborers to work in Lackawanna County, 8 scouting crews and 3 crews of laborers to work in Wayne County, and 2 scouting crews to work in Carbon County. In addition, 4 crews of N. Y. A. enrollees performed scouting work in Luzerne County. Several of the crews in the Pennsylvania area were engaged in scouting wood lots found to be infested in previous years, and which were subsequently thinned and cleaned of ground debris. Work in such locations progresses more rapidly than in the average woodland, where many egg clusters are deposited in concealed locations in dead or defective trees, in thickets, and on all types of ground litter. Much treatment work was done at gypsy moth infestations in South Canaan and Salem, in Wayne County, where it was necessary to tear down numerous stone walls, creosote the egg clusters, and rebuild the walls. Selective-thinning operations were also conducted at these infestations. About 15,000 gypsy moth egg clusters were destroyed at the center of the South Canaan infestation. The outside limits of these infestations, indicated by the absence of egg clusters, were located early in November. Close scouting work around an infestation in Paupack, Wayne County, indicated that only a small area is affected, and it is believed that this colony can be exterminated without difficulty. Scouting work at a site where a male gypsy moth was recovered at an assembling cage in Cherry Ridge, Wayne County, was completed in November. No indication of the presence of the gypsy moth was found.

PLANT DISEASE CONTROL

Bureau-sponsored W. P. A. project for North Dakota.--Presidential letter dated September 29, 1941, approved a Bureau-sponsored W. P. A. State-wide barberry-eradication project, which was started November 3 in Emmons County. Work will also be carried on in Logan and McIntosh Counties, which are in the same W. P. A. unit and district as Emmons. At present the assigned personnel consists of 1 nonrelief superintendent and 19 relief laborers, including 4 foremen. State, district, and local W. P. A. officials, as well as farmers, business men, and others located in the areas in which operations are in progress, are manifesting interest and cooperation in barberry eradication.

Barberry bushes found in Big Fork area of Montana.--Work under the recently approved State W. P. A. project was started in the Big Fork area on a narrow strip of land, much of which is low and swampy, at the north edge of Flathead Lake. In this area 18 escaped bushes were located, ranging in height from 8 inches to 6- and 8-foot fruiting bushes. Upon completion of this small tract, the survey was moved to wooded areas along the Flathead River and, by the close of November, 8 additional bushes had been found, mostly large and fruit-bearing. In this area some of the most suspected terrain has not yet been worked; however, preliminary reconnaissance in this locality already had revealed 1 location of 15 "escapes" including fruiting bushes, and 2 other locations of large, individual fruiting barberries. At this time 35 relief laborers and 1 nonrelief superintendent are assigned to the project. As is the case elsewhere, it is necessary to take assignments of a number of older men, several of whom are from 60 to 65 years of age. The average age of relief laborers now on the project in Flathead County is 51 years.

Barberry-eradication activities in Nebraska.--During the current fiscal year inspection crews have been established in various counties in Nebraska. At present, seven crews are operating in the northern Nebraska counties and four are working the southern unit. As workers become available additional crews will be added in the southern counties. With the State enjoying one of the most favorable crop-production years in nearly a decade, plus the stimulus of defense activity, procurement of efficient labor under current limitations proved to be a difficult problem. All of the certified skilled workers employed on the Nebraska project entered private employment with the approach of the harvest season. With the exception of three foremen who later returned to the project, all have continued in the status of private employment.

Memoranda to crew men.--Enthusiastic reports have been received concerning a series of memoranda prepared and distributed in Massachusetts this year by C. C. Perry, State leader, for the information of the field men engaged in the actual eradication of Ribes. During the 1941 field season 14 memoranda were issued; that is, 1 approximately every 2 weeks. These brief statements were designed to give emphasis to important points involved in the field work and to acquaint the workers with different phases of the entire control program so as to stimulate their interest, and psychologically they seem to have a very helpful effect in that the system serves to tie the individual field man into the general control setup. The 1941 series of memoranda were titled as follows: (1) The Blister Rust Control Crew as a Unit; (2) Searching for Ribes; (3) Favored Locations for Ribes Growth; (4) Uprooting and Disposal of Ribes; (5) Making and Following "The Line;" (6) Miscellaneous Weaknesses in Control Work; (7) Blister Rust Kills White Pines of All Sizes; (8) The Eradication of Ribes is Effective in the Control of Blister Rust; (9) Annual Examinations Not Needed to Maintain Control of Blister Rust; (10) Blister Rust Quiz--Questions; (11) Blister Rust Quiz--Answers; (12) Blister Rust Cankers on White Pine Persist after Ribes-Eradication Work; (13) Why Blister Rust Control is Important in the Economic System; and (14) Thank You for Your Efforts! The final memorandum was mailed direct to the laborers (relief and nonrelief). It contained a brief word of recognition of the part played by the individual worker in the control program. The fact that this word came direct from "the office" seemed to be especially appreciated.

Blister rust display.--C. C. Perry also reports that he assisted District Leader William Clave with a blister rust display at the second annual Worcester County Conservation Congress and Exposition, held cooperatively by the biological department of Clark University and the Worcester Museum of Natural History. The display was a duplicate of the one recently staged by District Leader R. E. Wheeler at the Eastern States Exposition, which proved to be very successful. David Potter, director of the Museum of Natural History, saw the original display at Springfield and was so impressed by it that he requested District Leader Clave to abandon another display he had been planning and to duplicate the one at Springfield. Mr. Perry has been requested to transfer the central panel of this display to the Worcester Museum of Natural History to be used as a part of their collection of aids to visual education in natural history.

Data on white pine.--The following, selected from a list published in the July issue of Northern Region News, region 1, Forest Service, are a few facts on the importance of western white pine in the Northwestern region: "More than a million matches can be made from an average Idaho white pine tree. In order to supply the demand for matches made from Idaho white pine, about 13,000 acres must be logged annually. The manufacture of a million feet of finished pine lumber provides employment for 13 men for the greater part of a year. In 1939, 77 percent of the lumber cut in the Northern Rocky Mountain region was Idaho white pine and ponderosa pine, compared with 65 percent in 1929 and 54 percent in 1919. Less than one-third of the merchantable timber remaining in Montana and north Idaho is white pine or ponderosa pine."

Development and use of Ribes-eradication tools.--H. R. Offord, of the Berkeley, Calif., office, reports that the two-pronged *Ribes* peavey and the hydraulic *Ribes* jack were tested on a number of *R. roezli* plants. The two-pronged peavey has proved to be an excellent tool for auxiliary clean-up work in areas where the power methods are being used. It is planned to make several more tools of this same design this winter. The hydraulic jack works effectively but appears to have no practical place in *R. roezli* eradication that cannot be taken care of as well or better by other tools and methods. The special problem which has been kept in mind in the development of the *Ribes* jack has been the eradication of large *R. nevadense* in stony ground, of which the Yosemite National Park has a considerable amount, where the draws are too narrow and steep to operate a tractor and where dynamite cannot be safely used because of stony soil and absence of trees or stumps for protection of the workers.

Inspection of pine and Ribes in the High Sierra country.--W. V. Benedict made a trip in the High Sierra country of Yosemite Park this fall, in company with Park Superintendent Frank Kittredge and members of his staff. The party examined principally the high country in the upper basin of the South Fork of the Merced River, along the boundary of the park as it adjoins the Sierra Forest. They noted a general distribution of both *Pinus albicaulis* and *P. monticola* in the high country, but in no locality did these 5-needle pines occur in sufficient number to be considered as blister rust control units at present. *Ribes montigenum*, *R. viscosissimum*, and *R. cereum* were observed, and frequent inspections of the first two species were made to determine whether or not either blister rust or pinyon rust was present. No infections were found.

COTTON INSECT INVESTIGATIONS

Division conference.--The Division of Cotton Insect Investigations held a conference at the Delta Branch of the Mississippi Agricultural Experiment Station, Stoneville, Miss., on December 10, 11, and 12. Representatives from all the field laboratories and the Washington office were in attendance. In discussing past and future investigations, the 19 divisional workers in attendance had the benefit of comments and suggestions from F. C. Bishopp, assistant chief of Bureau; C. M. Smith, of the Division of Insecticide Investigations; F. M. Wadley, statistical consultant of the Bureau; H. C. McNamara and others, of the Bureau of Plant Industry and the Delta Branch Experiment Station; Clay Lyle and A. L. Hamner, of the Mississippi Experiment Station; J. C. Gaines, of the Texas Experiment Station; Dwight Isely and W. R. Horsfall, of the Arkansas Experiment Station; and others. Results reported regarding investigations of the boll weevil and cotton aphid and their control suggested several changes in Bureau recommendations, as follows: (1) The making of boll weevil infestation counts may be simplified. The grower who wishes to determine the percentage of squares infested simply walks across his field, picking cotton squares at intervals until 100 squares are collected, taking care that the squares are collected in about equal numbers from the bottom, middle, and top branches of the cotton plants. These 100 squares are carefully examined and the number punctured by boll weevils is the percentage of infestation.

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(2) Instead of the former recommendation that dusting with calcium arsenate be started when 10 percent of the squares are infested, the studies indicated that in fields with fertile soils and plenty of moisture, where the cotton grows rank and continues fruiting until late in the season, it is not profitable to begin dusting until from 25 to 30 percent of the squares are infested; in fields where, because of low soil fertility, insufficient moisture, determinate growth of plants, or other factors, the plants do not grow rank and stop fruiting early, it is recommended that dusting begin when from 10 to 15 percent of the squares are infested. In areas where boll weevil damage is serious the growers are advised not to plant cotton in fields that cannot be expected to produce at least one-third of a bale if the weevil is controlled. (3) To prevent losses from the cotton aphid following the use of calcium arsenate for the control of the boll weevil, it was decided that the safest recommendation is the addition of 2-percent nicotine to the calcium arsenate for each alternate dusting. Investigations will be continued with 0.5 percent rotenone in each application that gave promising results in 1939 and 1940 but only fair results in 1941.

Boll weevil conference called for Atlanta.--In response to a call from agricultural officials in the Southeastern States for a full discussion of various phases of the boll weevil problem, P. N. Annand, chief of Bureau, M. L. Wilson, director of extension work, and James T. Jardine, chief of the Office of Experiment Stations and director of research, invited many State and Federal agencies to participate in a conference to be held in Atlanta, Ga., on January 8 and 9. The agencies requested to send representatives to this conference were the experiment stations, extension departments, agricultural colleges, departments of agriculture and other State agricultural officials in the eight Southeastern States--Alabama, Georgia, Florida, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. Invitations to participate were also sent to the following agencies in this Department: Agricultural Adjustment Administration, Bureau of Agricultural Chemistry and Engineering, Bureau of Agricultural Economics, Agricultural Marketing Service, Farm Credit Administration, Farm Security Administration, Federal Crop Insurance Corporation, Forest Service, Bureau of Plant Industry, and Soil Conservation Service.

Effect of boll weevil and cotton aphid control on yield, factorial experiment.--Experiments employing factorial designs were again conducted in 1941 at Florence, S. C., Gainesville, Fla., Tallulah, La., and College Station, Tex., to determine the comparative effect on infestation and yield of treatment with calcium arsenate dust for boll weevil control, with nicotine dust or spray for aphid control, and a combination of the two treatments. Small plots, ranging in size from 1/20 to 1/4 acre, arranged in randomized blocks, were used. The results at the different localities have been summarized by R. C. Gaines as follows: The combined records for all localities show that the treatment-locality interaction was highly significant, indicating as in 1940, that the differential response to treatments at the various localities may be attributed to the combination of infestations which prevailed during the course of each experiment. At Florence there was a heavy boll weevil infestation and an extremely light infestation of aphids. At Gainesville there was a very light infestation of weevils and a heavy aphid infestation. At Tallulah there was a heavy infestation of both weevils and aphids, and at College Station the boll weevil infestation was intermediate and the aphid infestation light. Average records of the boll weevil infestations, aphid populations, and the yields at all localities are shown in the following table.

Treatment	Boll weevil-punctured squares	Aphids per square inch	Yield per acre
	Percent	Number	Pounds
Check	35	5.92	668
Calcium arsenate	18	22.54	900
Either nicotine dust or spray	36	1.07	738
Calcium arsenate and either nicotine dust or spray	17	3.51	1,150

Parasites of the pink bollworm.--L. W. Noble, of the Presidio, Tex., laboratory, reports that a shipment of Calliephialtes dimorphus Cush. was received from Brazil on November 6. This was the second shipment received this year through cooperation with the Division of Foreign Parasite Introduction. It arrived in good condition and consisted of 2 adults and 66 pupae. Breeding of this species was continued during the month and the larvae after spinning cocoons were placed in cold storage. Small-scale breeding of Chelonus pectinophorae Cush., Microbracon nigrorufum Cush., and the new Microbracon sp. (near vulgaris (Ashm.)) was continued. The Microbracon larvae were placed in cold storage. C. pectinophorae will be carried over winter by continuous breeding on the Mediterranean flour moth. Material for a parasite hibernation test was collected from a field in which Chelonus blackburni Cameron and C. pectinophorae had been released during the summer. Approximately 4,500 bolls were collected and placed in hibernation cages on November 13.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Gin-trash inspection.--During the month inspection of gin trash was continued in Arizona in Maricopa, Pima, and Pinal Counties, and 264 additional specimens of the pink bollworm were found in the vicinity of Glendale, Maricopa County, bringing the season's total for that rather limited area to 701 specimens. No pink bollworms were found in any other part of the Salt River Valley, and results were negative for the season in Pima and Pinal Counties. Last year 2 pink bollworms were found in Pinal County. In the Pecos Valley of New Mexico inspection of 156 bushels of trash from Eddy County yielded 12 pink bollworms. From about that same quantity of trash last year 266 pink bollworms were taken. In Chaves County inspection of trash yielded 1 specimen of the pink bollworm, which is the first finding since the 1938 crop, when 3 larvae were found. In Luna County, N. Mex., 19 specimens of the pink bollworm were taken for the season through examination of about 9 bushels of trash. In the Texas Panhandle regulated area larger quantities of trash were examined than for several years past, but the only pink bollworms found were in Terry County, where 2 specimens were taken. These were the first pink bollworms taken from that county since 1938. Last season very light infestations were found in that area in Howard, Martin, and Midland Counties. Outside of regulated areas, inspection was performed in the San Joaquin Valley and Riverside County, Calif., with negative results as to pink bollworm infestation. Some inspection was also done at Mexicali, Baja California, Mexico, with negative results. Inspection of a considerable quantity of trash in Sonora and Sinaloa, Mexico, gave negative results as to pink bollworm infestation. Inspection of trash in the Juarez Valley of Mexico showed several rather heavily infested spots. Gin trash inspection of the 1941 cotton crop was brought to a close at the end of November. As a result of the season's inspection, no new areas were found infested with the pink bollworm, and in a considerable number of counties found infested last year results were negative for the 1941 crop.

Stalk destruction.--Climatic conditions in south Texas are conducive to the growth and fruiting of the cotton plant throughout the year. Consequently, in combating the pink bollworm in that region it is necessary to create an off-cotton-growing season by destroying the stalks as soon as the crop is picked out, and, in order to maintain this condition, all sprout or stub cotton that develops prior to the fruiting of the subsequent planted crop must be destroyed. On account of extremely unfavorable conditions over a period of several months farmers were unable to comply with the State regulation requiring the completion of stalk destruction in October, and extensions were granted to permit completion of harvesting. Fairly good progress was made with stalk destruction in November, although rains interfered with all field activities in most areas. Of the 206,700 acres planted to cotton in the counties comprising the Coastal Bend district, stalks had been either cut or plowed on 204,298 acres at the end of November, leaving 2,402 acres of standing stalks. In the lower Rio Grande Valley counties of Cameron, Hidalgo, Starr, and Willacy, comprising 233,100 acres of cotton, only 765 acres of stalks remained standing at the end of November, 395 acres of this being in the area flooded by high waters from the Rio Grande and a little over a hundred acres is abandoned acreage. Also, during the month, fields were being systematically checked for standing random stalks or sprout cotton, and grubbing crews were operating in Cameron, Hidalgo, and Willacy Counties in an effort to destroy all plants that might furnish material for build-up of infestation. In many instances farmers are cooperating by replowing fields where stalks make grubbing impracticable. At the end of November grubbing crews had removed scattered stalks or sprout plants from 35,393 acres.

Wild cotton eradication.--Wild cotton eradication work for the present season began during the first half of October with a small number of W. P. A. workers. At the beginning of November, 65 workers had been assigned and by the close of the month the number had been increased to 88. The increase in number of workers was reflected in the increase in acres covered and plants destroyed. A total of 3,033 acres was covered, from which 89,230 plants were removed. It is encouraging to note that only 65 of these plants were far enough developed to produce fruit. At the close of November the first clean-up for the season had been completed on Long Key and the Matecumbes in the Keys subdistrict, and most of Key Largo had been covered, and work was in progress in the Marathon and Key West sections and along the west coast of Florida. The first clean-up for the season in Florida Bay and along the Dade County mainland east of Cape Sable was started about the middle of the month.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Carbon disulfide treatment effective against wireworms.—A marked reduction of wireworms in shade-grown tobacco plots treated with carbon disulfid was noted by A. W. Morrill, Jr., of the Windsor, Conn., laboratory, during a small-scale experiment in which the effects of carbon disulfide treatment were compared with those of deep plowing and of no control. A total of 36 plots, each containing 1/40 acre, were arranged in randomized blocks and each treatment was replicated 12 times. The carbon disulfide was applied, in holes made in the soil, at the rate of 1 ounce every 15 linear inches, or a total of 30.25 pints per plot. The population of wireworms, as revealed by an examination of 144 1/4-square-foot samples taken at random at the rate of 12 per plot, showed a highly significant reduction of 90.47 percent in the plots treated with carbon disulfide, as compared to 30.3 percent in the untreated plots. The reductions occurred during a week of unusually hot weather with no precipitation, characteristic of much of the season. This condition of high temperature and low moisture in the soil, while ideal for the use of carbon disulfide, is unfavorable for recovering wireworms for comparison. Results on effect of plowing cannot be determined until spring. The difference between populations in areas receiving various control treatments appears less marked when the general population is small than when it is relatively large. The principal species of wireworms involved in these tests was Limonius agonus (Say), referred to in many publications as the eastern field wireworm, in synonymy with L. ectypus (Say). It is now believed that the former species is the predominant one in this region since no specimen of L. ectypus (Say) have been recovered in tobacco or potato fields.

Fumigation tests with 1, 1-dichloro-1-nitroethane.--R. W. Brubaker and W. D. Reed, of the Richmond, Va., laboratory, report that high mortality of the larvae of the cigarette beetle (Lasioderma serricorne (F.)) was obtained in the fumigation of baled tobacco at reduced pressure with 1, 1-dichloro-1-nitroethane. Six replications each were conducted with bales of imported cigarette tobacco (Turkish types) using dosages of 4 pounds and 3 pounds, respectively, per 1,000 cubic feet, with an exposure of 3 hours. The tests were conducted in a steel vacuum chamber 50 by 36 by 22 inches, with a total volume of 33 cubic feet. The following is a summary of the results obtained.

Dosage	Larvae treated	Mortality at inches' depth--				
		1-1/4	3-1/4	5-1/4	7-1/4	9-1/4
	Number	Percent	Percent	Percent	Percent	Percent
4 lb. per 1,000 cu. ft.-------	1,500	99.7	100	99	99.0	99.3
3 lb. per 1,000 cu. ft.-------	1,500	99.3	99.7	99	94.6	99.0

These results are the first obtained with this gas on tobacco. At these dosages it is apparently highly effective against cigarette beetle larvae, and further tests will be conducted at lower dosages. No deleterious effects on the tobacco were noted.

Relation of crops to survival of new-brood wireworms.--Studies by E. W. Jones and K. E. Gibson, of the Walla Walla, Wash., laboratory, performed in 1/100-acre plots and in 5 by 5-foot cages, have shown some differences between certain crops as to their effect on survival of wireworms during their first season of growth after hatching from eggs. There is some difference in the survival of the Pacific coast wireworm (Limonius canus Lec.) and the sugar-beet wireworm (L. californicus (Mann.)) on the various crops, but in general the following seems to be true for the last several seasons: The best survival by far was shown when germ-killed corn was the only food in the cages. When growing crops were used as food the best survival took place with wheat and potatoes in both the plots and cages. The poorest survival was with onions and alfalfa. Clover and corn show a good survival of new-brood larvae the first season, but not so good as with wheat and potatoes. Sugar beets, lima beans, and carrots seem to be intermediate between the above crops in their effect on survival.

Increased infestation of narcissus bulb fly in Pacific Northwest.--In the annual survey conducted by the staff of the Sumner, Wash., laboratory during August and September 1941, to determine the infestation of Merodon equestris (F.), C. F. Doucette reports that the heaviest general average infestation ever recorded was encountered this season. The average infestation for 22 plantings in Washington was 5.14 percent, for 18 plantings in Oregon it was 9.14 percent, and the average for the 2 States combined was 6.66 percent. The highest infestation previously noted was last year, when it was 4.84 percent in Washington, 7.71 percent in Oregon, and 5.85 percent for the 2 States combined. The figures are comparable because the same narcissus variety and the same size of bulbs have been sampled throughout the survey work. In 1941 infestations above 20 percent were found in 5 places, with the highest 27.4 percent. At 9 places the infestation ranged between 10 and 20 percent, at 9 places it ranged between 5 and 10 percent, and in 17 places it was below 5 percent. At 2 locations the findings were negative, corresponding with similar findings in previous years.

Effect of pepper weevil insecticides on aphids.--Observations by R. E. Campbell and J. C. Elmore, of the Alhambra, Calif., laboratory, on the effect of applications of insecticide dusts to commercial plantings of peppers, for the control of Anthonomous eugenii Cano, showed that the application of calcium arsenate resulted in a considerable increase in the aphid population on peppers, and that cryolite caused a moderate increase in the population of aphids. The addition of a sufficient quantity of cube to give a 0.5 percent content of rotenone in the final mixture of the dust retarded the rate of aphid development and increase in abundance. The aphid infestations became quite serious in several fields dusted with calcium arsenate, showing considerable honeydew and sooty mold fungus. In 1941, however, before the aphid infestation became bad enough to cause defoliation, natural enemies of the aphids appeared and so reduced the number of aphids that little damage was done.

Beet leafhopper in sugar beets grown for seed.--Van E. Romney, of the Phoenix, Ariz., laboratory, reports that a survey of all seed-beet-growing districts in the Southwest, as well as of the surrounding desert areas, to determine infestation by Eutettix tenellus (Bak.) was completed during the latter part of September. This survey showed that populations of the leafhopper were low in the beet fields located in the Salt River Valley, Ariz., and that desert conditions are such that further movements of any consequence from these areas to the beet fields are improbable. Seed-beet plantings near Perris and Hemet, Calif., contained low populations of the leafhopper but conditions were such in the breeding source that additional movement to the fields may be expected. Beet field populations at Safford, Ariz., were fairly high and additional influxes of the leafhoppers from adjacent desert areas are expected. Control measures will undoubtedly be necessary in this area and preparations for spraying were being made by the seed contractors and farmers. Seed beet plantings in the Mesilla Valley of New Mexico contained moderately high populations of the leafhopper on September 26. At that time only one field examined had sufficiently high numbers to warrant control measures. Conditions in the surrounding desert territory were such that additional influxes of the leafhopper were expected. Spraying will probably be necessary in at least some of the fields susceptible to curly top in this region. Sugar beets grown for seed in the Southwest are planted in the fall, usually late in August or in September. From the time the two-leaf plants appear until soil coverage by the foliage is attained during the latter part of October, the beet leafhopper is the major insect pest of varieties susceptible to curly top.

Pyrethrum-oil sprays for stored-tobacco insects.--J. N. Tenhet, of the Richmond, Va., laboratory, reports that a pyrethrum-oil spray containing 0.2 percent total pyrethrins, applied at 7-day intervals in a tobacco warehouse, gave apparently satisfactory control of the tobacco moth (*Ephestia elutella* (Hbn.)). Test lots of tobacco moths were placed in the warehouse during applications and the mortality was about 100 percent. The mortality of cigarette beetles (*Lasioderma serricorne* (F.)) was only 16 percent when placed under the same conditions. Records obtained from insect traps showed the spray to be more effective in controlling the tobacco moth than were applications of pyrethrum powder. Data obtained during the experiment indicated that sublethal dosages of pyrethrum affected the rate of oviposition of females of the cigarette beetle. Trap catches for the period May 1 to September 11 showed a total of tobacco moths per warehouse as follows: Sprayed warehouse, 2,147 moths; dusted warehouse, 11,806 moths; and untreated warehouse, 35,385 moths.

INSECTS AFFECTING MAN AND ANIMALS

Diking as a control measure against sand flies.--J. B. Hull, of the Fort Pierce, Fla., laboratory, reports that in a series of 8 1-quart samples collected from diked marshes of pickleweed and mangrove, an average of 2.62 larvae per quart sample was isolated, as compared to an average of 8.92 larvae isolated from an equal number of samples collected from undiked marshes.

Cooperative advisory service to county agents and others for control of cattle grubs.--Arrangements have been made with the Texas Extension Service by E. W. Laake and R. W. Wells, of the Dallas, Tex., laboratory, for cooperative demonstrations on the control of cattle grubs and cattle lice by the use of powered equipment. Demonstrations will be made in Anderson County (eastern Texas), Johnson County (north-central Texas), and four counties in west-central Texas.

Cube-wettable sulfur dip retains toxicity for at least 10 days.--An examination on November 29 by Messrs. Laake and Wells revealed no living lice on 2 animals dipped in a vat containing cube-wettable sulfur dip, which had been used 10 days previous for dipping 661 animals. The dip had remained exposed for the interval indicated and had retained sufficient toxicity to destroy all the motile forms of the short-nosed ox louse.

Sesame oil and pine oil as synergists for pyrethrum in mosquito larvicides.--In a series of tests on lots of *Culex* larvae, G. H. Bradley, of the Orlando, Fla., laboratory, reports that no increase in mortality was obtained with the use of sesame oil and pine oil as synergists for pyrethrum extract, when used in the proportions of 1 part activator to 9 parts pyrethrum extract.

Public Health Service employees report for preliminary instruction.--H. D. Pratt, assistant entomologist, and John Fluno and Eugene Gerberg, junior entomologists of the U. S. Public Health Service, reported at the Orlando laboratory the last week in November for preliminary instruction before undertaking salt-marsh-mosquito surveys in the vicinity of National Defense areas.

FOREIGN PLANT QUARANTINES

Moths at sea.--On September 15, R. F. Wilbur boarded the small American sailing yacht *White Cloud*, which had just arrived direct from Hawaii at Tacoma, Wash. He found four dead moths adhering to the oiled deck of the yacht. R. R. Pratsch, owner, captain, and navigator of the yacht, told Mr. Wilbur he had run into a great cloud of these moths on September 10 at 46° 37' N., 130° 10' W., which was about 240 miles southwest of the nearest land, Vancouver Island, British Columbia. He said the air was full of the moths for several hours and many of them lit on the yacht. The wind was from the north-northwest. Mr. Pratsch was particularly interested and made a notation of his location in his logbook at the time. The moths were identified as *Peronea variana* (Fernald). On June 20 the Forest Service submitted to us for identification some larvae which they had received from outside sources, collected at Snoqualmie Pass, where infestation was said to be very heavy on white fir. E. I. Smith reared the larvae, the adults emerging during the first week of August. This material was submitted to the Washington, D. C., office on August 21 and was also identified as *Peronea variana*. Referring especially to Mr. Pratsch encountering the flight of moths at sea, indicating a possible migratory habit, an article "Butterfly Travelers," in the May 1937 issue of the National Geographic Magazine, by B. C. Williams, chief entomologist, Rothamsted Experimental Station, Harpenden, England, is of interest. Mr. Williams requests information on flights of moths and butterflies.

Gladiolus smut.--In the News Letter dated April 1, 1941 (v. VIII, No. 4, pp. 27-28) is summarized the status of the *Papulospora* and "smut" found or reported on gladiolus corms. In a paper appearing the following month (Torrey Bot. Club Bul. 68:289-294, May 1941), B. O. Dodge and Thomas Laskaris seemed to feel that a single fungus was involved in reports of the occurrence of gladiolus smut (*Urocystis gladioli* (Requien) Smith) and that it was not a smut but a *Papulospora*, which they described as *P. gladioli* (Requien) Dodge and Laskaris, comb. nov. D. P. Limber gave Mr. Dodge a culture of the *Papulospora* found at the Inspection House on gladiolus corms from Holland, and from Pennsylvania Mr. Dodge received a culture of the fungus found on gladiolus in Pennsylvania and reported as *U. gladioli*. J. A. Stevenson received a letter from S. P. Wiltshire, director of the Imperial Mycological Institute, Kew, Surrey, England, in which he stated that their collections include specimens of a true smut on gladiolus. On November 7 Mr. Limber discussed the matter with Dr. Dodge at the New York Botanical Garden and learned that Dr. Dodge had received material of a true smut on gladiolus from the herbarium of G. L. Zundel, of Pennsylvania State College, and had studied the afore-mentioned cultures. He now believes that probably three species of *Papulospora* are involved--*P. gladioli*, which he found at various times on 20 percent of diseased corms in collections made from a commercial storage house; *P. coprophila* (Zukal) Hotson, as determined by J. W. Hotson on Holland corms taken at the Inspection House; and the undetermined species found in Pennsylvania and first reported as *U. gladioli*. Apparently a true smut occurs on gladiolus abroad, but is not known to occur in the United States, and considerable care must be exercised to avoid possible confusion of species of *Papulospora* with the smut.

Sclerotinia kerneri (?) on fir in New Hampshire.--The finding of what appeared to be *Sclerotinia kerneri* Wetts. on balsam fir from Newfoundland was reported in the December 1, 1940, News Letter (v. VII, No. 12, p. 27). Later similar symptoms were found on material from Nova Scotia. While on vacation, L. J. McConnell, one of the New York inspectors, found similar symptoms on balsam firs growing near Lonesome Lake, in the White Mountain National Forest in New Hampshire. In November 1941 the same symptoms were found by J. T. Beauchamp, of the Boston inspection force, on balsam fir Christmas greens from Lancaster, N. H. *S. kerneri* causes the host to produce buds in practically every leaf axil in young growth. Sclerotia form later within the scales in some cases and most of them or the male cones drop out, leaving rows of scale rosettes. The only sclerotia seen, in American material, were a few in one collection from Christmas trees from Newfoundland. Only weathered material had been noted until the Lancaster, N. H., material was found to bear great numbers of small unopened buds in the axils of the leaves. It is hoped that interest in the fungus may be stimulated to the point where its distribution, life history, and likelihood of spread with Christmas greens and nursery stock may be made available.

Entomological interceptions of interest.--Living specimens of the thrips *Anaphothrips orchidaceus* Bagn. were intercepted at San Francisco on October 30 on *Odontoglossum* sp. in mail from England. Two dead larvae of the euribiid *Anastrepha mombinpraeoptans* Sein were intercepted at Boston on October 19 in grapefruit (not cultivated) in stores from St. Vincent. This represents our second interception of an *Anastrepha* from St. Vincent. The first interception was also made at Boston in mango in stores. The coccid *Asterolecanium miliaris longum* (Green) was found at New York on August 22 on a bamboo leaf in mail from Antigua. Living larvae of the cerambycid *Clytus arietis* L. were taken at Seattle on September 4 in an elm branch used as cleat to hold plants in place from England. Forty-four living larvae of the Mediterranean fruitfly (*Ceratitis capitata* (Wied.)) were intercepted at New York on October 10 in apples in baggage from Portugal. Twenty-nine living larvae and approximately 50 eggs of the melonfly (*Dacus cucurbitae* (Coq.)) were taken at San Francisco on October 1 in three pods of *Phaseolus vulgaris* in stores from Hawaii. Living and dead adults of the bostrichid *Dinoderus pilifrons* Lesne were intercepted at New York on October 24 in dry bamboo used as dunnage from India. Living adults and nymphs of the mirid *Eurycipitia vestitus* (Dist.) were found at Laredo on September 30 on orchids in baggage from Mexico. Living specimens of the lygaeid *Exptochiomera tumens* (Stal) were intercepted at Hoboken on August 8 with *Cattleya* sp. in cargo from Venezuela. A living larva of the tortricid

Platynota rostrana (Walk.) was taken at New York on August 26 in grapefruit in cargo from Cuba. A living adult of the curculionid *Tadius erirhinoides* Pascoe was taken at San Francisco on August 19 on *Cypripedium haynaldianum* in air express from the Philippines.

DOMESTIC PLANT QUARANTINES

Survey of wild host plants of sweetpotato weevil yields significant data.--An over-all survey of wild morning-glory plants and other species of *Ipomoea* was conducted early in the fall by T. R. Stephens, field project leader on sweetpotato weevil control. In the commercial sweetpotato-growing areas where eradication of the weevil is in progress, wild morning-glory plants have not been considered a serious problem, as they are rather sparsely distributed in the eradication areas and it is believed that they do not harbor the weevils over winter. However, in the southern coastal areas there are concentrations of numerous wild host plants, some perennials and others essentially so, which have seemed, on rather limited observation, to be capable of harboring the weevils throughout the year. Further information was needed as to the relative abundance of *Ipomoea*, native host plants of the genus, and their relation to the weevil, for use in considering possible expansion of control operations into these coastal areas. The survey, which was purely cursory,was made in the five coastal counties of Alabama and Mississippi. Special attention was given to concentrations of host plants in close proximity to the formerly infested areas. Infestations were found in *I. sagittata*, the perennial marsh morning-glory, which grows abundantly along water edges. Light infestations were found in the upland type, *I. pandurata*. No weevils were found on the annual species of wild morning-glories. Very recently infestations have been found in sweetpotato fields from which the weevils apparently had been eradicated, and of special significance was the discovery that in a number of cases these infestations were in close proximity to native host plants. The survey further showed that infestations are established in some species of wild plants remote from places where sweetpotatoes have been planted, at least in recent years. The information derived from this general survey, which points suspicion to several species of *Ipomoea* as plants which carry the weevils over winter, will be the subject of a conference with State cooperators in considering future policies of the control programs in these States. Georgia State inspectors found, in the inspection of nearly 1,800,000 wild host plants at Thomasville, that sweetpotato weevils will overwinter in that area on *I. trichocarpa*, a plant of perennial characteristics. The only weevils recently found in the city of Thomasville, after more than 4 years of eradication measures, are those on the wild host plants. The eradication of these plants from the Thomasville area has been conducted by W. P. A. laborers. This work has recently been suspended for the winter.

Sweetpotato inspections resumed in Texas.--Inspection activities were resumed in Texas in November, with the return to this project of the inspector who had been temporarily assigned to citrus canker inspection. With the assistance of State inspectors, sweetpotato weevil inspection was conducted in Angelina and San Augustine Counties and resumed in Madison and Harrison Counties. The work in Angelina County was centered on formerly infested properties where eradication was undertaken in 1940 for the protection of the commercial areas in the adjacent counties of Nacogdoches and Cherokee from which, it is believed, the weevils have been eradicated.

Chinch bug survey approaches completion.--The chinch bug survey, begun on November 3 in Illinois, Indiana, Iowa, Kansas, Missouri, and Nebraska, and on November 22 in Oklahoma, was completed in three of these States by the end of the month and nearly completed in the other States. Throughout the survey, Philip Luginbill, of the Division of Cereal and Forage Insect Investigations, maintained contact with State leaders and discussed with them survey methods and procedure and made field observations.

Mole cricket control work terminated.--The program, which was begun on September 9, for the control of mole crickets in parts of Florida was completed in the week ended November 26. All equipment and supplies were transported to Gulfport, Miss., for storage, with the exception of equipment and trucks used by the research units. Preliminary reports show that during the season nearly 2,200,000 pounds of bait was mixed and furnished to the Florida State Mole Cricket Control Committee for distribution to growers in 11 counties, 3 percent having been distributed in the Plant City area. Last year over 2,500,000 pounds of bait was mixed and distributed to growers in 12 counties, 45 percent having been used in the Plant City area. Throughout the program, close contact was maintained between the control supervisors and research workers of the State of Florida and the Division of Truck Crop and Garden Insect Investigations in order to take advantage of current information in regard to infestations and optimum-control methods.

Survey and plans on grasshopper and Mormon cricket control.--The grasshopper egg survey of the areas infested with Melanoplus mexicanus (Sauss.) was completed in November in nearly all areas. The survey is yet to be made in infested sections of the Southwest. The survey personnel in the Denver office continued the analysis of the survey data obtained thus far and the computation of bait estimates for 1942.

Conference on grasshopper and Mormon cricket control.--Representatives of the Federal and State agencies cooperating in grasshopper and Mormon cricket control will meet at Denver on January 19-20, to discuss a suggested plan of operations for the control of these pests in 1942. Invitations are being extended to directors of extension, and to directors or commissioners of agriculture and State leaders to attend this conference.

Infected peach trees removed.--The November work on the phony peach and peach mosaic project was confined to the removal of diseased, abandoned, and escaped peach trees. In Georgia, on November 11, there remained in Macon County 16,000 phony trees which had not been destroyed, because of inability to obtain relief labor. To meet this situation, three tractors borrowed from the white-fringed beetle project were employed, and with the use of these machines the number of infected trees throughout the State had been reduced to 3,000, which are rapidly being taken out. In Alabama the standing infected trees were reduced during the month from 7,840 to 20. The destruction of phony trees also went forward in Arkansas, and of mosaic trees in California and Colorado. State cooperation was represented by 3 field supervisory employees in Alabama, 2 in Georgia, and 1 office worker in Alabama.

Citrus canker eradication.--Citrus canker inspection was conducted in 13 Texas counties in November and crews of W. P. A. laborers, totaling 102, strip-worked formerly infected properties in 6 counties, destroying 167,000 seedlings of Citrus trifoliata. In the Navasota area, where citrus canker was found last February, formerly infected properties have been rechecked at regular intervals and recurring seedlings destroyed in cycles of germination in an effort to destroy any incipient infection before it could spread to other properties.

Transit-inspection activities.--The recent strike of express employees at Detroit, resulting in an additional burden on parcel post, freight, and trucking, necessitated rearrangement of the inspection tours to meet the irregularity of the movement of plant material passing through this gateway. A considerable movement of woody plants, greenhouse stock, bulbs, citrus fruits, and granite was found, with heavy express shipments after the strike was settled. At Chicago arrangements have been made with a freight company operating air freight to report to inspectors all shipments of plant material. At New York, with the approach of the Christmas season, the regular force of four inspectors has been increased by the assignment of three transit inspectors from other cities to inspect shipments of Christmas trees from the New England area. A Japanese beetle inspector at New York is also assisting. Interceptions of uncertified evergreen cones and bittersweet cuttings were made in November, one consisting of a freight shipment of cones. On three occasions since July 1, Japanese beetle grubs have been found in shipments intercepted by inspectors in the Northeastern States.

Permits to barberry shippers.--Forty-six nurserymen have been issued permits under the provisions of the black-stem rust quarantine to ship species of Berberis and Mahonia not susceptible to rust infection into or between the protected States, namely, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, Virginia, West Virginia, Wisconsin, and Wyoming. The permits, which are valid for the current fiscal year, are based on inspections conducted by the Division of Plant Disease Control.

CONTROL INVESTIGATIONS

Toxicity to adult mosquitoes of aerosols produced by spraying solutions of insecticides in liquefied gas.--A paper on this new method of producing insecticidal aerosols was read at the Eastern Branch meetings of the American Association of Economic Entomologists by W. N. Sullivan. The work was done in cooperation with L. D. Goodhue, of the Division of Insecticide Investigations. This paper described the preparation and application of the aerosols in controlling adult mosquitoes in confined spaces. Aerosols of pyrethrum oleoresin and sesame oil were prepared by allowing a solution of these materials in dichlorodifluoromethane to escape through an atomizing nozzle. The solvent evaporates very rapidly and leaves the insecticide suspended in the air. After some preliminary tests to determine the dosage for complete mortality in 5 minutes, tests of a practical nature were run on Culex, Aedes, and Anopheles mosquitoes. Culex mosquitoes were fed only on sugar solution, but the other species were also given a blood meal. The nontoxic nature of this insecticide to man and animals, its noninflammability, its ease of application with no power requirement, and its nonstaining properties appear to answer the requirements proposed for the control of mosquitoes on airplanes. Additional preliminary tests show the aerosol to be very effective against several kinds of flies and promising against other insects. These findings will be published in the February 1942 issue of the Journal of Economic Entomology.

A new laboratory method for testing roach sprays.--When petroleum-oil spray, similar to petroleum-base fly sprays, is discharged at close range directly from the sprayer onto cockroaches, the amount delivered in a very short time is usually far more than enough to cause 100-percent mortality. It is also true that if a sprayer is turned on and off rapidly to reduce the quantity of insecticide applied, the type of spray produced is often decidedly different from that produced when the sprayer is operating continuously; furthermore, extremely short intervals of spraying are difficult to time accurately if the valve controlling the spraying is operated manually. To meet these difficulties, E. R. McGovran and J. H. Fales constructed a pendulum apparatus which permitted the spray to pass through an opening onto the roaches only while the pendulum was in one phase of its swing. A 10-inch pendulum was used, which was short enough to travel rather rapidly. As the rate of swing of a pendulum of a given length operating through a given amplitude is constant, such an apparatus should give an accurately timed, although very brief, exposure of the insects to the direct spray. Below the pendulum a glass cylinder 9 inches tall and 6 inches in diameter, with a 3/4-inch hole in the top and a 1/4-inch opening around the bottom, covered a metal pen 3-1/2 inches in diameter and 2-1/2 inches deep (tin cups with the handles removed) which confined the insects. The inner surface of the wall of the cup was very lightly coated with petroleum oil of heavy medicinal grade, to keep the roaches from escaping or clinging to the walls of the pen. To operate the apparatus the pendulum was pushed to one side until the spray nozzle (a nasal atomizer with the tip pointed down) was directed at the crescent-shaped partition attached to the oscillating end of the pendulum about 1 inch from one end of the partition. The air pressure was turned on and the atomizer was sprayed on the end of the partition until the mercury gage indicated the correct air pressure had been established. The pendulum was then released and allowed to swing uniformly the number of times needed to give the required deposit. The average deposit of insecticide for each passage of the 2-inch opening in the partition on the pendulum over the hole in the top of the cylinder was 0.104 mg. of spray per square centimeter. A summary of comparable tests of sprays of pyrethrins dissolved in refined kerosene, ranging in pyrethrin content from 1 to 5 mg. per ml. and in deposit from 2.6 to 0.8 mg. per cm.^{2}, against adult female German cockroaches (Blattella germanica (L.)), large nymphs, and adult males, caused mortalities of 73, 87, and 98 percent, respectively, indicating that the adult females were the most resistant to these sprays. A series of tests on each group with a much heavier deposit (7.3 mg. per cm.^{2}) of highly refined kerosene without pyrethrins added caused 97, 60, and 41 percent mortality of large nymphs, adult male, and adult female German roaches, respectively. While the adult females were the most resistant to this spray, as in the ones containing pyrethrins, it is worthy of note that the nymphs were much less resistant than the adult males, which reverses their order of resistance as compared with the pyrethrum sprays. As these sprays were applied as "wet" sprays to the dorsal surface of the insects the wings of the adults may have absorbed some of the oil and thus reduced its lethal effect.

INSECTICIDE INVESTIGATIONS

Plants reported to contain rotenone.--A list of plants reported to contain rotenone or rotenoids has just been compiled by H. A. Jones. Rotenone or compounds related to it have been definitely reported in 67 different species of leguminous plants. Of these species, 21 are of the genus Tephrosia, 12 of Derris, 12 of Lonchocarpus, and 10 of Millettia. Eleven additional species of legumes are listed in which reports indicate the probable presence of rotenone or rotenoids. It is of interest to note that there is to date no authentic record of these compounds having been found in a plant not of the family Leguminosae and of the subfamily Papilionate. The list should prove helpful in the development of new sources of rotenone and rotenoids in case supplies of the usual commercial sources are curtailed because of the war.

Preparing insecticidal aerosols by spraying solutions in liquefied gases.--Numerous requests have been received for directions on the preparation of insecticidal solutions in liquefied gas similar to those tested against mosquitoes by Sullivan, Goodhue, and Fales. The following brief outline of the method is suggested by L. D. Goodhue and more complete details will appear shortly in an ET circular. The safest liquefied gas to use is dichlorodifluoromethane known to the trade as "Freon 12." It is relatively nontoxic to man and animals, noninflammable, and is generally available at any local refrigeration-supply house. A solution of pyrethrum oleoresin, with sesame oil as a synergist, in the solvent produces, when sprayed under its own pressure (approximately 90 lbs. per sq. in.), a persistent and safe aerosol which is very effective against mosquitoes, flies, and, at high concentrations, against roaches. The apparatus required consists of a 5-pound-capacity freon tank and an oil-burner nozzle of about 2-gallons-per-hour capacity. Enough pyrethrum oleoresin to make about 5 mg. of total pyrethrins per g. of solution and twice this amount of sesame oil is drawn into the empty tank by suction. The air is again withdrawn from the tank and the freon is introduced from a large supply tank through a flexible hose. The amount is determined by difference in weight. Some shaking mixes the solution. With the nozzle attached it is only necessary to invert the tank and open the valve to produce the aerosol.

BEE CULTURE

Nectar from Pima and Acala cotton blossoms.--Geo. H. Vansell, Davis, Calif., reports on his investigations on nectar secretions, which are being conducted under controlled laboratory conditions. Pima cotton blossoms secreted nectar far in excess of the Acala. The respective averages of the quantity per blossom throughout October 1941 were 58 mg. and 4 mg. No significant difference was noted in the sugar concentration of these two varieties; both averaged, when protected from evaporation, from about 18 to 20 percent. The Pima variety had daily more than twice the number of blossoms per plant as the Acala variety of the same age and treatment. The nectar secretion occurs only during part of the first day the blossoms open. Secretion proceeds in a seemingly normal fashion, even when a blossom is severed from the plant. Chemical analysis revealed the practical absence of sucrose in this nectar. The respective percentages of sucrose, levulose, and dextrose were 0.35, 9.25, and 10.36 in a liberal quantity of Pima nectar. Acala nectar was not significantly different.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Two species of Mezium in the United States.--For some years it has been thought that only one species of spider beetles of the genus Mezium was

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represented in the United States. It is evident now that the European species *Mezium affine* Boield. has been in this country at least since 1904 but has been misidentified as *M. americanum* Cast. The latter species was originally described from South America. From specimens at hand, it appears that *M. americanum* is restricted to the Gulf States, whereas *M. affine* is distributed throughout the eastern part of the country, southward to Florida and westward to Iowa.

Artipus floridanus abundant in Florida.--Occasionally an insect ordinarily of little economic importance becomes sufficiently numerous to attract attention. This seems to be the case with *Artipus floridanus* Horn, one of the otiorhynchid weevils, which was reported to be especially abundant at Fort Lauderdale, Fla., in November. The beetles seemed most numerous near the seacoast. Among the plants attacked were *Citrus*, sea grapes, *Melaleuca*, *Ixora*, coco palms, *Plumbago*, *Hibiscus*, *Chalcas*, and roses.

Larvae of Gasterophilus removed from lion.--There were received for identification recently larvae of a species of the botfly genus *Gasterophilus*, which had been submitted by C. M. Herman, technical advisor, Los Angeles Wildlife Disease Research Station. Mr. Herman stated that the larvae were taken from a lion on October 17, 1941, at Gay's Lion Farm, just outside of Los Angeles. The specific differences for the larvae of this genus are not completely understood; therefore a specific identification is not possible at present. However, the larvae appear to be very similar to those of *G. nasalis* (L.), which usually attacks the horse. This is the first known record of botfly larvae from a lion.

Type material added to collection of Hymenoptera.--Type material of 25 species of wasps was deposited recently in the National Collection by K. V. Krombein. Identified material of only one of these species was present previously in the collection of the United States National Museum.

Probable origins of incorrect records of host-parasite relationships.--Many of the published records of host relations of parasitic insects are incorrect because of various circumstances such as misidentification of host or of parasite, the assumption that all parasites reared from material known to be infested by a certain species were parasitic on that species, confusion of notes or labels, and other factors. An excellent example of an erroneous record of host-parasite association has recently come to notice. A Bureau field worker submitted for identification a hymenopteron said to have been reared from the pupa of a coccinellid beetle. It was suggested by the specialist making the identification that the record must be incorrect, because the parasite in question is known to attack only chrysopid larvae. Subsequent investigation of the host material, which had not been submitted with the specimen, disclosed the fact that a chrysopid larva had spun its cocoon within the pupal exuviae of the coccinellid. This indicates what extreme care is sometimes necessary to avoid mistakes in host-parasite records.

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